



EXPRESS MAIL LABEL NO. EV462385749US

PATENT APPLICATION

Docket No. 16096.6

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND  
INTERFERENCES

In re application of

Khemani et al.

Serial No.

10/087,718

) Art Unit

) 1711

Confirmation No.

7476

Filed:

March 1, 2002

For:

BIODEGRADABLE FILMS AND SHEETS SUITABLE  
FOR USE AS COATINGS, WRAPS AND PACKAGING  
MATERIALS

Examiner:

Umakant K. Rajguru

Customer No.:

022913

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Date of deposit: October 21, 2004.

- Appeal Brief (in triplicate)
- Appendix (in triplicate)
- Forms PTO-2038 in the amount of \$340
- Transmittal Letter
- Postcard

Respectfully submitted,

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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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MATERIALS

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Examiner: Umakant K. Rajguru

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Mail Stop APPEAL BRIEF - PATENTS

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Sir:

Transmitted herewith are the following for entry in the above-identified application:

## • Appeal Brief and Appendix (each in triplicate)

- Enclosed with this transmittal is a Form PTO-2038 in the amount of \$340 for filing brief in support of appeal.
- The Commissioner is hereby authorized to charge payment of any other fees associated with this communication or credit any overpayment to Deposit Account No. 23-3178. Duplicate copies of this sheet are attached.

Dated this 21<sup>st</sup> day of October 2004.

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EXPRESS MAIL LABEL NO. EV462385749US

PATENT APPLICATION  
Docket No. 16096.6



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND  
INTERFERENCES

## **APPEAL BRIEF OF APPELLANTS**

Mail Stop Appeal Briefs - Patent  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

Appellants Khemani et al. previously filed a timely Notice of Appeal from the action of the Primary Examiner in finally rejecting all of the claims in this application. This Appeal Brief is being filed under the provisions of 35 U.S.C. § 134(a) and 37 C.F.R. § 1.192.

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### **REAL PARTY IN INTEREST**

Biotec Biologische Naturverpackungen GmbH is the real party in interest, as evidenced by the Assignment recorded at reel 13362, frame 921.

### **RELATED APPEALS AND INTERFERENCES**

None.

### **STATUS OF CLAIMS**

Pending claims: 1-38.

Cancelled claims: none.

Rejected claims: 1-38.

Allowed claims: none.

Appealed claims: 1-38.

### **STATUS OF AMENDMENTS**

No amendment after final rejection was filed.

### **SUMMARY OF THE INVENTION**

The invention is directed to articles of manufacture comprising a biodegradable film or sheet that is particularly well-suited for use as coatings, wraps or other packaging materials. According to one aspect of the invention, the films and sheets are formulated and/or processed in order to have high “dead-fold”, which is a measurement of the tendency of a sheet or film to maintain a crease, crinkle, fold or other bend. Application page 46, lines 12-13. The standard test used to measure dead-fold is set forth in detail at page 46, line 13 – page 47, line 25 of the application. Wraps made from paper, for example, typically have modest to excellent dead-fold depending on how it is processed or treated. *Id.* at page 5, lines 15-17. Another well-known food wrap that has high dead-fold is aluminum foil. In contrast, many plastic films and sheets (*e.g.*, polyethylene) have very poor dead-fold (*i.e.*, they cannot

maintain a crease or fold) and make poor wraps (*i.e.*, because they tend to spontaneously unwrap or unfold if wrapped around something). *Id.* at page 5, lines 17-18; page 10, lines 15-17. On the other hand, the “self-cling” of certain polymer films, sometimes relied upon to offset poor dead-fold, has little or nothing to do with dead-fold and is akin to using an adhesive. *Id.* at page 5, lines 20-23.

In order to yield a wrap that is biodegradable the present invention utilizes one or more biodegradable polymers. *Id.* at page 18, line 1 – page 30, line 21. According to one embodiment, a novel blend of “stiff” and “soft” biodegradable polymers is used in order to obtain a wrap that can be more easily formed using existing film-blowing or sheet casting apparatus and/or that has desired properties. *Id.* at page 18, line 23 – page 19, line 14. In order to yield biodegradable sheets or films having adequate dead-fold (*e.g.*, to yield a food wrap that remains wrapped around a piece of food), the biodegradable polymers or polymer blends can be filled with particulate fillers and/or the sheets or films can be textured. *Id.* at page 19, lines 14-16; page 10, lines 13-16.

In addition to improving dead-fold, texturing a film or sheet (*e.g.* by using knurled or embossing-type rollers) also improves the “bulk hand feel” of the sheets or films. *Id.* at page 11, lines 10-17; page 43, line 23 – page 44, line 5. Another way to increase the bulk hand feel and/or dead-fold of the sheets or films is to include particulate fillers in which at least a portion of the particles have a particle size diameter that equals or exceeds the thickness of the polymer film or sheet. *Id.* at page 37, lines 3-6; page 44, lines 6-9. Such particles may protrude from the surface of the sheet or film. *Id.* at page 13, lines 2-7.

## ISSUES

1. Whether claims 1-8, 12 and 15-17 are anticipated under 35 U.S.C. § 102(a) by U.S. Patent No. 6,261,674 to Branham et al. (“*Branham*”).

2. Whether claims 1-38 are unpatentable under 35 U.S.C. § 103(a) as being obvious over *Branham*.

3. Whether claim 14 is unpatentable under 35 U.S.C. § 103(a) as being obvious over *Branham* in view of U.S. Patent No. 6,168,857 to Andersen et al. ("Andersen").

### **GROUPING OF CLAIMS**

Claims 1-12, 14, 15, 18-23, 27, 28, 36 and 38 stand or fall together.

Claims 13, 26, 29, 30, 35 and 37 stand or fall together.

Claims 16 and 17 stand or fall together.

Claims 24, 25 and 31-34 stand or fall together.

### **ARGUMENT**

#### **I. SUMMARY OF OFFICE ACTION**

The Office Action of August 5, 2004 ("Final Action") finally rejected claims 1-8, 12 and 15-17 under 35 U.S.C. § 102(b)<sup>1</sup> as being anticipated by *Branham*. The Final Action also finally rejected claims 1-38 under 35 U.S.C. § 103(a) as being unpatentable over *Branham*. Although the Final Action does not maintain the rejection of claim 14 over the combination of *Branham* and *Andersen* set forth in the office action dated January 28, 2004 ("Non-Final Action"), page 3 of the Final Action makes reference to *Andersen* and argues against Appellants' position with respect to *Andersen*.

#### **II. INCORPORATION OF PREVIOUS ARGUMENTS**

Appellants incorporate by reference the arguments in support of patentability set forth in Amendment "D" and Response in their entirety. To the extent that the rejection of claim 14 persists relative to *Andersen*, Appellants also incorporate any applicable arguments set

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<sup>1</sup> Appellants point out that *Branham* is not prior art under 35 U.S.C. § 102(b) because it issued less than 1 year before the filing date of the present application. This fact was brought to the attention of the Examiner in Amendment "D" and Response but was evidently ignored in the Final Action.

forth in Amendment "C" and Response filed August 21, 2003, Supplemental Amendment "B" filed February 25, 2003, and Amendment "A" and Response filed February 5, 2003, as well as the Declaration of Per Just Andersen, Ph.D. Under 37 C.F.R. § 1.132.

**III. THE FINAL ACTION FAILS TO STATE A *PRIMA FACIA* CASE OF ANTICIPATION RELATIVE TO CLAIMS 1-8, 12 AND 15-17 AND THESE CLAIMS ARE IN FACT NOT ANTICIPATED BY BRANHAM**

For a claim to be anticipated, a single source must contain all of the elements of the claim. *See Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1379, 231 USPQ 81, 90 (Fed. Cir. 1986); *Atlas Powder Co. v. E.I. du Pont De Nemours & Co.*, 750 F.2d 1569, 1574, 224 USPQ 409, 411 (Fed. Cir. 1984); *In re Marshall*, 578 F.2d 301, 304, 198 USPQ 344, 346 (CCPA 1978). Missing elements may not be supplied by the knowledge of one skilled in the art or the disclosure of another reference. *See Structural Rubber Prods. Co. v. Park Rubber Co.*, 749 F.2d 707, 716, 223 USPQ 1264, 1271 (Fed. Cir. 1984). Moreover, the single source must disclose all of the claimed elements "arranged as in the claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 9 USPQ.2d 1913, 1920 (Fed. Cir. 1989); *Connell v. Sears Roebuck & Co.*, 722 F.2d 1542, 1548, 220 USPQ 193, 198 (Fed. Cir. 1983).

When an examiner rejects a claim under 35 U.S.C. § 102, he has the initial burden of establishing anticipation. "[I]t is incumbent upon the Patent Office . . . to set forth clearly why it regards a claim to be anticipated . . ." *In re Mullin*, 481 F.2d 1333, 1336, 179 USPQ 97, 100 (CCPA 1973). An examiner may not merely assert that a particular reference anticipates a claim. He must show where the cited reference teaches every claim limitation. *See In re Mullin*, 481 F.2d at 1336-37, 179 USPQ at 100.

The Final Action does not state any grounds for rejecting claims 1-8, 12 and 15-17 as currently amended but says to "Pl[eas]e refer to earlier office action of January 28, 2004 for these rejections." Final Action, page 2. The problem with relying on the Non-Final Action is

that the rejections contained therein do not relate to the claims currently at issues but to claims that existed prior to the filing of Amendment “D” and Response on April 16, 2004. Subsequent to the Non-Final Action, claim 1 was amended to specifically recite an article of manufacture comprising “a biodegradable sheet or film having a single layer formed by extruding, blowing or casting a thermoplastic melt formed from a biodegradable thermoplastic composition”. Amendment “D” and Response, page 2 (emphasis in original to show added claim language). Simply referring to the Non-Final Action fails to show where *Branham* discloses every element recited in claim 1 as now amended because the Non-Final Action does not address the subsequent claim amendments.

The statement at page 2 of the Final Action that “extrusion of film of single layer (as well as multiple layers) is a technique well known for many years” and that “[i]t is therefore obvious that one of ordinary skill will use the composition of *Branham* to produce a single layer film by extrusion” is irrelevant to the issue of anticipation. According to the case law cited above, a single reference must disclose every limitation, either literally or inherently. What may arguably be “obvious” is not a valid basis for establishing *prima facie anticipation* under 35 U.S.C. § 102. Appellants therefore contend that the Final Action fails to state a *prima facie* anticipation rejection relative to claims 1-8, 12 and 15-17.

Moreover, claims 1-8, 12 and 15-17 are, in fact, novel over *Branham*, which discloses a microlayer polymer film comprising a plurality of coextruded microlayers including a first layer comprising a first melt-extrudable polymer and a second layer comprising a second melt-extrudable polymer, wherein the first melt-extrudable polymer has a first water vapor transmission rate and the second melt-extrudable polymer has a second water vapor transmission rate less than the first water vapor transmission rate.

Col. 1, lines 41-48 (emphasis added). Because *Branham* discloses a “microlayer polymer film comprising a plurality of coextruded microlayers” (emphasis added), *Branham* in fact

fails to disclose each and every limitation recited in claim 1 “arranged as in the claim” (*i.e.*, “a biodegradable sheet or film having a single layer”). *Branham* therefore fails to anticipate claims 1-8, 12 and 15-17.

Claim 15 further recites that “the sheet or film comprises a food wrap”. *Branham* et al. discloses microlayer films suitable for use in making “diapers, feminine care products, adult incontinence products, and training pants, and health care products such as wound dressings or surgical gowns.” Col. 2, lines 2-5. As one contemplates the look, feel and properties of “diapers, feminine care products, adult incontinence products, and training pants, and health care products such as wound dressings or surgical gowns”, it is plain that *Branham* et al. hardly discloses sheets or films having properties that render them suitable for use as a “food wrap”.

**IV. THE FINAL ACTION FAILS TO STATE A *PRIMA FACIA* CASE OF OBVIOUSNESS RELATIVE TO CLAIMS 1-38, AND THESE CLAIMS ARE IN FACT UNOBFVIOUS OVER *BRANHAM***

The legal standard applicable to obvious rejections under 35 U.S.C. § 103 are set forth in MPEP §§ 2142-43 as follows:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant’s disclosure.

**A. The Office Action Fails to Identify any Teaching or Suggestion in the Prior Art That Would Have Motivated One of Ordinary Skill in the Art to Modify Branham to Obtain the “Biodegradable Sheet or Film” of Claims 1-38, nor does the Prior Art in Fact Provide any Such Motivation**

As discussed above in the section entitled “Summary of the Invention” the claimed invention is directed to articles of manufacture comprising a biodegradable sheet or film. According to THE AMERICAN HERITAGE DICTIONARY OF THE ENGLISH LANGUAGE 133 (1981) (a copy of which is attached as Exhibit A), the term “biodegradable” means “[c]apable of being decomposed by natural biological processes.” It is well-known to those of skill in the art and also to laymen that many plastics are not biodegradable (*i.e.*, they do not decompose by natural biological processes, such as microbial action). Non-biodegradable plastics, such as polystyrene, polyethylene, polypropylene and polyvinyl chloride, are known to persist for many years or decades if discarded into the environment. For this reason cities around the country have instituted comprehensive recycling programs to recycle bottles, films, etc. made of polyethylene, polyolefins, and similar plastics that are not biodegradable.

In order for an article of manufacture or composition to be biodegradable, it must comprise components that are both biodegradable and arranged in a manner that allows biodegradation to occur. For example, a sheet or film that contains co-extruded layers of biodegradable and non-biodegradable polymers may not be biodegradable if the non-biodegradable layers shield the biodegradable layers from natural biological processes and prevent them from biodegrading. Even if one or more layers of biodegradable polymer are able to biodegrade, the one or more layers of non-biodegradable polymer will not biodegrade, leaving behind films or layers of non-biodegradable polymer that persist without biodegrading.

In Amendment “D” and Response, Applicants amended the independent claims to recite “[a]n article of manufacture comprising a biodegradable sheet or film having a single layer” to emphasize its biodegradable nature (*i.e.*, its ability to decompose by natural biological processes such as microbial action). In contrast to co-extruded sheets or films that comprise one or more layers of a non-biodegradable polymer, a “biodegradable sheet or film having a single layer” formed from a thermoplastic composition that is itself biodegradable yields a sheet or film having a configuration that permits biodegradation. In some cases, the “biodegradable thermoplastic composition” used to form the claimed “biodegradable sheet or film” includes “at least one type of filler particles” mixed with “at least one thermoplastic biodegradable polymer”. *See* independent claims 1, 18, 32 and 36. Unlike co-extruded layers of non-biodegradable polymer, the filler particles inherently comprise a disperse phase within a continuous phase or matrix of biodegradable polymer and therefore do not inhibit biodegradation of the biodegradable polymer.

Turning to the rejection at hand, it is undisputed that *Branham* discloses articles of manufacture comprising co-extruded layers of different polymers, some of which are non-biodegradable polymers. In the section entitle “Background of the Invention” *Branham* describes the need for personal care products to be “breathable” while also “providing a barrier to liquids” and being “strong enough to endure handling in normal use”. Col. 1, lines 22-24. *Branham* goes on to state that “certain polymers are more breathable than others, but have unsatisfactory barrier and tensile properties. Other polymers have superior barrier or tensile properties, but are not sufficiently breathable.” Col. 1, lines 30-34. *Branham* concludes this section by stating that “there is a need for a polymeric film with enhanced breathability and desirable barrier and strength properties for use in making personal care

items, health care items, and the like.” Col. 1, lines 34-36. Immediately thereafter, *Branham* states the following:

This invention satisfies the above-described need by providing a breathable microlayer polymer film comprising a plurality of coextruded microlayers including a first layer comprising a first melt-extrudable polymer and a second layer comprising a second melt-extrudable polymer, wherein the first melt-extrudable polymer has a first water vapor transmission rate and the second melt-extrudable polymer has a second water vapor transmission rate less than the first water vapor transmission rate.

Col. 1, lines 40-48 (emphasis added).

The layered nature of the disclosed multi-layer films and the contribution of the individual layers to the overall properties of the films are discussed throughout the *Branham* disclosure. *E.g.*, col. 1, lines 48-52; col. 1, line 57 – col. 2, line 5; col. 2, lines 12-19; col. 3, lines 5-31; col. 4, lines 7-17; col. 4, line 50 – col. 5, line 31; col. 5, line 2 40-52; col. 6, lines 20-38; col. 10, lines 12-20; col. 10, lines 41-55; col. 11, lines 41-48; col. 12, line 45 – col. 14, line 28. The first and second co-extruded layers according to *Branham* are “arranged in a series of parallel repeating laminate units, each laminate unit comprising at least one of the first layers and at least one of the second layers.” Col. 2, lines 15-19. According to *Branham*, the individual layers “form laminate films with high integrity and strength because they do not delaminate after microlayer coextrusion.” Col. 5, lines 15-18. “Microlayers enable combination of 2 or more layers of normally incompatible polymers into a monolithic film with a strong coupling between individual layers without using compatibilizing agents.” Col. 5, lines 18-21. *Branham* further teaches that the “multiple layers” of the “monolithic film” are able to “adhere to one another and function as a single unit”. Col. 5, lines 21-23.

The first layers of the *Branham* films “consist essentially of the first, more breathable, melt-extrudable polymer”, which “must be melt-extrudable so that the polymer can be coextruded along with the second, less breathable polymer to form the microlayer film.” Col.

5, lines 40-45. The second layer of the *Branham* films “consists essentially of the second, less breathable melt-extrudable polymer”. Col. 6, lines 20-22. “Particularly suitable second polymers include polyolefins such as homopolymers of polyethylene or propylene, copolymers of ethylene and propylene, polyethers, copolyethers, and mixtures thereof.” Col. 7, lines 3-6. Other exemplary second polymers include polyethylene terephthalate, polyvinylidene chloride, vinylidene chloride copolymers, polyvinyl fluoride, and polyvinylidene fluoride, and aliphatic polycarbonates. Col. 7, lines 7-11. Specific examples include Dowlex® NG 3347A, which is a linear low density polyethylene (LLDPE), metallocene polyethylene (MPE), Affinity® EG 8200, which is a saturated ethylene-octene copolymer, and 6D81 and 6D82, which are polypropylene random copolymer resins. Col. 7, lines 15-23.

It is notoriously well-known that polyolefins and the other exemplary second polymers are not biodegradable. Nor does the Final Action even allege that they are. Therefore, it is undisputed that at least one, if not both, of the first and second layers comprising the *Branham* films is not biodegradable. If both of the first and second layers of the *Branham* films are made from non-biodegradable polymers it follows that such films are likewise not biodegradable. Even assuming for the sake of argument that the first layer comprises a biodegradable polymer, one of skill in the art would not expect the overall film to be biodegradable given the laminate structure of the co-extruded films in light of the fact that the second layer is not biodegradable.

In any event, the Final Action does not even allege that the co-extruded films made according to *Branham* are biodegradable. Instead, the entire rejection rests on the following premise:

On page 9 (of above response), the applicants state that “Branham neither teaches nor suggests a sheet or film comprising a single layer etc etc.” This statement is not persuasive because though Branham teaches film of multiple layers, extrusion of film of single layer (as well as multiple layers) is a technique well known for many many years. It is therefore obvious that one of ordinary skill will use the composition of Branham to produce a single layer film by extrusion. Applicant’s biodegradable film or sheet having a single layer is not patentably distinguishable from that of Branham.

Final Action, page 2. The problem with the foregoing statement is at least two-fold. First, it begs the question as to why one of skill in the art would have been motivated to modify *Branham* in this manner. Second, and more fundamentally, such a modification is so contrary to the teachings of *Branham* that it would render the *Branham* films unsatisfactory for their intended purpose.

According to MPEP § 2142,

The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. “To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.” *Ex parte Clapp*, 227 USPQ 972, 973 (Bd. Pat. App. & Inter. 1985).

In the present case, the Final Action cites to no teaching or suggestion in the art that would have motivated one of skill in the art to modify *Branham* in order to obtain a single layer film or sheet. Therefore, the entirety of the rejection rests on whether the Final Action presents “a convincing line of reasoning” as to why it would have been obvious to modify *Branham* to yield single layer sheets. Appellants submit that the Final Action contains no line of reasoning at all, let alone one that is convincing. Instead, the sole rationale given by the Final Action is that it was generally well-known to make both single- and multi-layer films, *i.e.*, that it was “obvious to try” or that it was within the capability of the skilled artisan to modify *Branham*. These are not valid grounds for establishing obviousness. *See* MPEP § 2143.01. In actuality, the sole motivation in the file history for modifying *Branham* is the

desirability of providing a single layer film or sheet that is biodegradable, which is found in the present application, not the prior art. This is also an improper ground for finding obviousness. *See* MPEP §§ 2142-43 (“The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant’s disclosure.”). On this basis alone, Appellants submit that the Final Action fails to state a *prima facie* obviousness rejection.

Moreover, the MPEP is clear that “the proposed modification cannot render the prior art unsatisfactory for its intended purpose”. MPEP § 2143.01. “If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *Id.* (citing *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Moreover, “the proposed modification cannot change the principle of operation of a reference”. *Id.*

As set forth above, the multi-layer structure of *Branham* is critical to the function and operation of the disclosed films. The first layer is necessary to impart breathability, and the second layer is necessary to impart strength and barrier properties not provided by the first layer. Col 1, lines 57-67. The combination of first and second layers is necessary to render films that are suitable for making diapers, feminine care products, adult incontinence products, training pants, wound dressings, and surgical gowns. *See* col. 1, line 67 – col. 2, lines 5. The multi-layer structure is the critical aspect of the invention disclosed in *Branham* that solves the technical problem set forth in the background section. *See* col. 1, lines 22-48. Therefore, it would be contrary to *Branham* to modify the teachings disclosed therein to yield “a biodegradable film or sheet having a single layer”. Because the multi-layer aspect of the *Branham* films is necessary for such films to operate according to their intended function or purpose, it would not have been obvious to one of skill in the art to modify *Branham* to yield

an article of manufacture comprising “a biodegradable film or sheet having a single layer”.

*See* MPEP § 2143.01.

In short, modifying a reference in a manner that renders it “unsatisfactory for its intended purpose” and/or that “change[s] the principle of operation of the prior art invention” is never “a convincing line of reasoning” as a matter of law. *See* MPEP §§ 2142 and 2143.01. For this additional reason Appellants submit that the Final Action fails to state a *prima facie* obviousness rejection because it fails to “present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references” as required by MPEP § 2142 in the absence of any actual teaching or suggestion in the art for the modification.

Finally, Appellants are unaware of any teaching or suggestion in the art that would have, in fact, motivated one of skill in the art to modify *Branham* in order to obtain “an article of manufacture comprising a biodegradable sheet or film having a single layer”. Moreover, to the extent one of skill in the art might have been motivated to try to manufacture such an article, *Branham* teaches away from any such article by emphasizing the criticality of a co-extruded multi-layer film comprising first and second layers that impart different properties unobtainable using a single layer.

**B. The Final Action Fails to Show Where *Branham* Teaches or Suggests Every Limitation Contained in the Claims, Nor does *Branham* in Fact Teach or Suggest Every Limitation**

**1. *Claims 1-38***

Notwithstanding the fact that the Final Action rejects claims 1-38 as being obvious over *Branham*, it fails to show where *Branham* teaches or suggests every limitation found in the claims. As discussed immediately above, *Branham* discloses a co-extruded multi-layer film comprising first and second layers. *Branham* further teaches that “the film of this

invention has first and second layers totaling 8 to 17,000 in number, and preferably 60 to 8000 in number.” Col. 2, lines 31-33. Because the Office Action fails to identify any teaching or suggesting in *Branham* or any other reference for “a biodegradable film or sheet having a single layer”, it fails to satisfy the clear requirements of MPEP §§ 2142 and 2143 (“the prior art reference (or references when combined) must teach or suggest all the claim limitations”) (emphasis added). Indeed, the Non-Final Action expressly admitted that “Branham discloses an article (viz film) formed by construing many micro layers comprising polymers”. Non-Final Action, page 2 (emphasis added). Appellants therefore submit that the Final Action fails to establish a *prima facie* case of obviousness of claims 1-38 over *Branham*, either alone or in combination with any other art of record, for this additional reason.

## 2. *Claims 13, 26, 29, 30, 35 and 37*

Claims 13, 26, 29, 30, 35 and 37 each recite that the biodegradable thermoplastic composition used to form the sheet or film “includes at least one stiff thermoplastic biodegradable polymer and at least one soft thermoplastic biodegradable polymer” (or language similar thereto). The terms “soft” and “stiff”, when used to describe biodegradable polymers, generally refer to the level of crystallinity and/or the glass transition temperature of the polymer in question. Application, page 8, lines 10-20. “Stiff” biodegradable polymers tend to have increased crystallinity and a higher glass transition temperature compared to “soft” biodegradable polymers. *Id.* Blending the two types of polymers together yields a thermoplastic material having desired properties imparted by each type of polymer. Application, page 7, lines 11-18. However, it should be understood that forming a blend of stiff and soft biodegradable polymers is much different than co-extruding multiple polymers in order to form a multi-layer film in which at least some of the layers consist of non-biodegradable polymers. Moreover, neither the Final Action nor the Non-Final Action even

alleges that *Branham* teaches or suggests the use of a biodegradable thermoplastic composition comprising both soft and stiff biodegradable polymers. For this reason, Appellants submit that the Final Action fails to establish that claims 13, 26, 29, 30, 35 and 37 are *prima facie* obvious over *Branham*, either alone or in combination with any other art of record, for this additional reason.

Moreover, Appellants submit that *Branham* in fact fails to teach or suggest the manufacture of sheets or films from a biodegradable thermoplastic composition comprising both soft and stiff biodegradable polymers. Whereas *Branham* teaches that the first layer may comprise polymers that are identified in the present application as being biodegradable (e.g., polycaprolactone), *Branham* does not teach or suggest the desirability of blending together “soft” and “stiff” biodegradable polymers to manufacture a sheet or film having a single layer. For this additional reason, Appellants submit that claims 13, 26, 29, 30, 35 and 37 are unobvious over *Branham*, either alone or in combination with any other art of record.

### 3. *Claims 16 and 17*

Claim 16 recites a sheet or film that “is textured by a knurled or embossing-type roller so as to have a dead-fold of at least about 70%”. Claim 17 depends from claim 16. The Final and Non-Final Actions are both silent with respect to whether *Branham* teaches or suggests this limitation. Instead, the Final Action asserts, without any evidence or reasoning, that the “[l]imitation of instant claim 16 which requires the film to be textured is considered to be an obvious modification”. Not only does the Final Action fail to provide any evidence in support of this assertion, it does not even identify why or to whom texturing “is considered to be an obvious modification”.<sup>2</sup> The Office Action therefore fails to show where *Branham* teaches or

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<sup>2</sup> More fundamentally, the Office Action provides no reason as to why it would have been desirable to make such a modification. According to MPEP § 2142, “[t]he initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done.” (Emphasis added.)

suggests every limitation contained in claims 16 and 17. Moreover, Appellants have reviewed *Branham* and can find no teaching or suggesting regarding texturing, by a knurled or embossing-type roller or otherwise.

4. ***Claims 24, 25 and 31-35***

Each of claims 24, 25 and 31-35 defines a sheet or film in which “at least a portion of the filler particles protrude from a surface of the sheet or film”. Claims 25 and 34 are further limited to sheets or films in which “at least a portion of the filler particles have particle size diameters that exceed the thickness of the sheet or film”. Neither the Final Action nor the Non-Final Action alleges that *Branham* teaches or suggests a sheet or film in which “at least a portion of the filler particles protrude from a surface of the sheet or film”. Instead, the Non-Final Action throws out a particle size range (*i.e.*, 0.1 to 50 microns) and then compares it to the thickness range for the individual layers (*i.e.*, 10 angstroms to 150 microns) rather than the overall film thickness (*i.e.*, about 5 microns to about 1 millimeter). Non-Final Action, page 2; *see Branham*, col. 5, lines 31-33. The Non-Final Action fails to allege that *Branham* teaches or suggests the manufacture of films in which particles protrude from the film surface.

The Final Action likewise fails to show where this teaching is found in *Branham*. Instead, the Final Action at page 3 asserts, without referring to any teaching in the prior art, that “it goes without saying that any particle in a film will protrude from the surface of the film (or sheet) if and only if the diameter of the particle is greater than the thickness of film (or sheet)<sup>3</sup>”. The Office Action then concludes that “[t]his limitation is quite obvious and carries no patentability.”

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<sup>3</sup> Appellants do not agree that particles only protrude from a film surface “if and only if the diameter of the particle is greater than the thickness of the film (or sheet)”.

The problem with this logic is that it would allow an examiner to entirely disregard any limitation in a claim not taught or suggested in the cited art. This would allow the examiner to find a claim to be obvious without making the required showing that every limitation is taught or suggested in the prior art. In the context of the requirement in MPEP §§ 2142-43 that an examiner must show where the cited art teaches or suggests every limitation, it is simply impermissible for an examiner to reject a claim based solely on his or her personal opinion that a particular limitation “is quite obvious and carries no patentability”.<sup>4</sup>

In any event, Appellants can find no teaching or suggestion in *Branham* for the manufacture of a sheet or film in which “at least a portion of the filler particles protrude from a surface of the sheet or film”, let alone a sheet or film in which “at least a portion of the filler particles have particle size diameters that exceed the thickness of the sheet or film”.

#### **PRAYER FOR RELIEF**

In view of the foregoing, Appellants respectfully request the Board to vacate the final rejection and order the Examiner to allow each of the claims on appeal.

Dated this 21<sup>st</sup> day of October 2004.

Respectfully submitted,



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Registration No. 36,153  
Attorney for Applicant  
Customer No. 022913

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<sup>4</sup> More fundamentally, the Office Action provides no reason as to why it would have been desirable to manufacture a sheet or film having the qualities recited in claims 24, 25 and 31-35. “The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done.” MPEP § 2142.

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New York State, on the Susquehanna near the Pennsylvania border. Population, 76,000.

**bin-go** (bīng'gō) *n.* A game of chance in which players place markers on a pattern of numbered squares, according to numbers drawn and announced by a caller. Compare *lotto*, *keno*. —*interj.* Used to express pleasurable surprise or unexpected satisfaction. [Originally the winner's exclamation, from *bing*, ringing sound, sound expressing surprise (imitative).]

**Binh-dinh** (bīn'dīn'). Also *Binh Dinh*. A city of central South Vietnam, near the South China Sea. Population, 147,000.

**bin-na-ble** (bīn'ə-kəl) *n.* The nonmagnetic stand on which a ship's compass case is supported. [Earlier *bitable*, from Middle English *bitakle*, from Spanish *bitácula* or Portuguese *bitácola*, from Latin *habitaculum*, little house, from *habitare*, to dwell, abide, from *habere* (past participle of *habitus*), to have. See *ghab-* in Appendix.\*]

**bin-oc-u-lar** (bī-nōk'yā-lər, bī-) *adj.* 1. Pertaining to, used by, or involving both eyes at the same time. 2. Having two eyes arranged to produce stereoscopic vision. —*n.* Also *rare bin-o-cle* (bīn'ə-kəl) (for sense 2). 1. *Usually plural.* An optical device, such as a pair of field glasses, designed for use by both eyes at once. 2. Any binocular optical device. [BIN- + *OCULAR*.] —*bin-oc-u-lar-i-ty* *n.* —*bin-oc-u-lar-ly* *adv.*

**bi-no-mi-al** (bī-nō'mē-əl) *adj.* Consisting of or pertaining to two names or terms. —*n.* 1. *Mathematics.* An expression consisting of two terms connected by a plus or minus sign; a polynomial in two terms. 2. A taxonomic name in *binomial nomenclature* (see). [New Latin *binōmīum*: *BI*- + Greek *nomos*, portion, part (see *nom-* in Appendix\*).] —*bi-no'mi-al-ly* *adv.*

**binomial distribution**. *Statistics.* The frequency distribution of the probability of a specified number of successes in an arbitrary number of repeated independent Bernoulli trials. Also called "Bernoulli distribution."

**binomial nomenclature**. A system of classifying plants and animals by a double name, the first of which is the name of the genus and the second that of the species within the genus, for example, *Odobenus rosmarus*, the walrus.

**binomial theorem**. A mathematical theorem that specifies the expansion of a binomial to any power without requiring the explicit multiplication of the binomial terms.

**bi-nu-cle-ate** (bī-nōō'kli-āt, -āt', bī-nyōō') *adj.* Also *bi-nu-cle-ar* (ār), *bi-nu-cle-ated* (āt'ēd). Having two nuclei.

**Bin-ue**. See *Benue*.

**bio-, bi-**. Indicates life or living organisms; for example, *biocide*, *biotics*. [Greek, from *bios*, life, mode of life. See *gwei-* in Appendix.\*]

**bi-o-as-say** (bī'ō-ās'ā', -ā-sā') *n.* Evaluation of a drug by comparison of its effect with that of a standard on a test organism.

**bi-o-as-tro-nau-tics** (bī'ō-ās'trō-nōō'tiks) *n.* Plural in form, used with a singular verb. The study of the biological and medical effects of space flight.

**bi-o-cat-a-lyst** (bī'ō-kāt'ā-līst) *n.* A substance that initiates or modifies the rate of a biological process. —*bi-o-cat-a-lytic* (līt'ik) *adj.*

**bi-o-chem-is-try** (bī'ō-kēm'īs-trē) *n.* The chemistry of biological substances and processes. —*bi-o-chem'i-cal*, *bi-o-chem'ic* *adj.* —*bi-o-chem'i-cally* *adv.* —*bi-o-chem'ist* *n.*

**bi-o-cide** (bī'ō-sīd') *n.* A substance, such as a pesticide or an antibiotic, that is capable of destroying living organisms. [BIO- + *CIDE*.] —*bi-o-cid-al* (sīd'ēl) *adj.*

**bi-o-cli-ma-tol-o-gy** (bī'ō-kli'mā-tōl'ā-jē) *n.* The study of the effects of climatic conditions on organic life.

**bi-o-de-grad-a-ble** (bī'ō-dē-grād'ā-bəl) *adj.* Capable of being decomposed by natural biological processes: a *biodegradable detergent*. [BIO- + *DEGRAD*(E) + -ABLE.]

**bi-o-feed-back** (bī'ō-fēd'bāk') *n.* A technique whereby one seeks to consciously regulate a bodily function thought to be involuntary, as heartbeat or blood pressure, by using an instrument to monitor the function and to signal changes in it. *bi-o-fla-vo-noid* (bī'ō-flā've-nōōd') *n.* Any of a group of biologically active substances found widely in plants and functioning in the maintenance of the walls of small blood vessels. [BIO- + *FLAVON(E)* + -OID.]

**biog**, *biographer*; *biographical*; *biography*.

**bi-o-gen-e-sis** (bī'ō-jēn'ē-sis) *n.* Also *bi-o-gene-ny* (bī'ō-jē'ə-nē). 1. The doctrine that living organisms develop only from other living organisms and not from nonliving matter. 2. The generation of living organisms from other living organisms. —*bi-o-ge-ne'tic* (-jē-nēt'ik), *bi-o-ge-net'i-cal*, *bi-o-gene'ous* (bī'ō-jē'ə-nəs) *adj.* —*bi-o-ge-net'i-cally* *adv.*

**bi-o-geog-ra-phy** (bī'ō-jē-ōg'rā-fē) *n.* The biological study of the geographical distribution of plants and animals. —*bi-o-geog'ra-phy* (jē-ōg'rā-fik), *bi-o-ge'o-graph'ic-i-cal* *adj.*

**biog-ra-phy** (bī'ō-rā-fē, bē) *n.*, *pl.* *phies*. *Abbr. biog*. A written account of a person's life; a life history. [New Latin *biographia*, from Medieval Greek: *BIO*- + *GRAPHY*.]

**biol**, *biological*; *biologist*; *biology*.

**bi-o-log-i-cal** (bī'ō-lōj'ī-kəl) *adj.* Also *bi-o-graphic* (-grāf'ik). *Abbr. biol*. 1. Of or pertaining to biology. 2. Of, pertaining to, caused by, or affecting life or living organisms. —*n.* *Pharmacology.* A drug derived from a biological source. Often used in the plural. —*bi-o-log'i-cal-ly* *adv.*

**biological clock**. An intrinsic biological mechanism responsible

for the periodicity or other time-dependent aspects of certain classes of behavior in living organisms.

**biological warfare**. Warfare in which disease-producing microorganisms or organic biocides are used to destroy livestock, crops, or human life.

**bi-o-lo-gist** (bī'ō-lōj'ist) *n.* *Abbr. biol.* One who is trained in or specializes in biology.

**bi-o-logy** (bī'ō-lōjē) *n.* *Abbr. biol.* 1. The science of life and life processes, including the study of structure, functioning, growth, origin, evolution, and distribution of living organisms. 2. The life processes or characteristic phenomena of any group or category of living organisms. 3. The plant and animal life of a specific region or place. [German *Biologie*: *BIO*- + -LOGIE.]

**bi-o-lu-mi-nes-cence** (bī'ō-lōō'mā-nēs'əns) *n.* The emission of visible light by living organisms such as the firefly, various fish, fungi, bacteria, and other organisms. —*bi-o-lu'mi-nes'cent* *adj.*

**bi-o-ly-sis** (bī'ō-lē'sis) *n.* Death caused or accompanied by lysis. [New Latin: *BIO*- + -LYSIS.] —*bi'o-lytic* (bī'ō-lēt'ik) *adj.*

**bi-o-me** (bī'ōm') *n.* *Ecology.* A community of living organisms of a single major ecological region. [BIO(O) - + *OME*.]

**bi-o-met-rics** (bī'ō-mēt'riks) *n.* Plural in form, used with a singular verb. Also *bi-o-met-ry* (bī'ō-mēt'rē). The statistical study of biological data. —*bi'o-met'ric*, *bi'o-met'ri-cal* *adj.* —*bi'o-met'ri-cally* *adv.*

**bi-on-ics** (bī'ōn'iks) *n.* Plural in form, used with a singular verb. The application of biological principles to the study and design of engineering, especially electronic, systems. [BIO(O) - + (ELECTRONICS).]

**bi-o-nom-i-cs** (bī'ō-nōōm'iks) *n.* Plural in form, used with a singular verb. *Ecology* (see). [From French *bionomique*, pertaining to ecology, from *bionomie*, ecology: *BIO*- + -NOMY.] —*bi'o-nom'ic*, *bi'o-nom'i-cal* *adj.* —*bi'o-nom'i-cally* *adv.*

**bi-on-plasm** (bī'ō-plāz'm) *n.* Living protoplasm, especially as distinguished from its nonliving content. [BIO- + *PLASM*.]

**bi-op-sy** (bī'ōp'sē) *n.*, *pl.* *-sies*. The gross and microscopic examination of tissues removed from the body as an aid to medical diagnosis. [French *biopsie*: *BIO*(O) - + *OPSY*.] —*bi-op'sic* (bī'ōp'sik) *adj.*

**bi-o-scope** (bī'ō-skōp') *n.* An early motion-picture projector, used about 1900. [BIO- + *SCOPE*.]

**bi-os-co-py** (bī'ōskō-pē) *n.*, *pl.* *-pies*. Medical examination of a body to determine whether it is dead. [BIO- + *SCOPY*.]

**bi-o-sis**. Indicates a specific way of living; for example, *symbiosis*. [New Latin, from Greek *biōsis*, way of life, from *biōn*, to live, from *bios*, mode of life. See *gwei-* in Appendix.\*]

**bi-o-sphere** (bī'ō-sfēr') *n.* The totality of regions of the earth that support self-sustaining and self-regulating ecological systems. [BIO- + *SPHERE*.]

**bi-o-syn-th-e-sis** (bī'ō-sin'ē-thē-sis) *n.* The production of complex substances from simple ones by or with living organisms. —*bi'o-syn-thet'ic* (-thēt'ik) *adj.* —*bi'o-syn-thet'i-cally* *adv.*

**Biot** (byō), *Jean Baptiste*. 1774-1862. French physicist; studied polarization of light.

**bi-o-ta** (bī'ō-tā) *n.* The animal and plant life of a particular region considered as a total ecological entity. [New Latin, from Greek *biōtē*, way of life, from *bios*, life. See *bio-*.]

**bi-o-technol-o-gy** (bī'ō-tēk-nōōl'ō-jē) *n.* The engineering and biological study of relationships between man and machines. —*bi-ot'ic* (bī'ōt'ik) *adj.* Pertaining to life or specific life conditions. [Greek *biōtikos*, from *bios*, mode of life. See *bio-*.]

**biotic potential**. 1. The likelihood of survival of a specific organism in a specific environment, especially in an unfavorable environment. 2. The growth rate of a population that maintains a stable age distribution.

**bi-o-tin** (bī'ō-tēn) *n.* A colorless crystalline vitamin,  $C_{10}H_{16}N_2O_5$ , often considered in the vitamin B complex and found in large quantities in liver, egg yolk, milk, and yeast. Also called "vitamin H." [Greek *biōtios*, life, from *bios*, life, mode of life (see *gwei-* in Appendix\*) + -IN.]

**bi-o-tite** (bī'ō-tīt') *n.* A dark-brown to black mica,  $K(Mg, Fe)_3AlSi_3O_{10}(OH)_2$ , found in igneous and metamorphic rocks. [German *Biotit*, after J.B. BIOT.] —*bi'o-tit'ic* (-tīt'ik) *adj.*

**bi-o-top-e** (bī'ō-tōp') *n.* A limited ecological region or niche in which the environment is suitable for certain forms of life. [BIO- + Greek *topos*, place (see *topic*).]

**bi-o-type** (bī'ō-tip') *n.* A group of organisms having identical genetic but varying physical characteristics. —*bi'o-typ'ic* (-tip'ik) *adj.*

**bi-pa-ras** (bī-pär'əs) *adj.* 1. *Biology.* Producing two offspring in a single birth. 2. *Botany.* Having two axes or branches, as certain flower clusters. [BIO- + *PAROUS*.]

**bi-par-ti-san** (bī-pär'ti-zən) *adj.* Consisting of or supported by members of two parties, especially two major political parties. —*bi-par'ti-san-ism* *n.* —*bi-par'ti-san-ship* *n.*

**bi-par-tite** (bī-pär'tit') *adj.* Also *bi-part-ed* (bī-pär'tid). 1. Having or consisting of two parts. 2. Having two corresponding parts, one for each party: a *bipartite treaty*. 3. *Botany.* Divided into two, almost to the base. Said of certain leaves. [Latin *bipartitus*, past participle of *bipartire*, to divide into two parts: BI- + *partire*, to part, from *par*, a share, part (see *pere-* in Appendix\*)] —*bi-par'tite'y* *adv.* —*bi'par'ti-tion* (-tish'ən) *n.*

tight/th thin, path/θ this, bathe/ü cut/ür urge/v valve/w with/y yes/z zebra, size/zh vision/ə about, item, edible, gallop, circus/ə Fr. ham/ə Fr. feu, Ger. schön/ü Fr. tu, Ger. über/KH Ger. ich, Scot. loch/N Fr. bon. \*Follows main vocabulary. †Of obscure origin.

## APPENDIX

1. An article of manufacture comprising a biodegradable sheet or film having a single layer formed by extruding, blowing or casting a thermoplastic melt formed from a biodegradable thermoplastic composition that includes:

- (i) at least one thermoplastic biodegradable polymer; and
- (ii) at least one type of filler particles,

wherein the sheet or film is stretched during processing so as to result in cavitation comprising tiny cavities in the vicinity of the filler particles.

2. An article of manufacture as defined in claim 1, wherein the filler particles comprise at least one of inorganic filler particles and organic filler particles.

3. An article of manufacture as defined in claim 1, wherein the inorganic filler particles have a concentration greater than about 10% by weight of the biodegradable thermoplastic composition.

4. An article of manufacture as defined in claim 1, wherein the inorganic filler particles have a concentration greater than about 20% by weight of the biodegradable thermoplastic composition.

5. An article of manufacture as defined in claim 1, wherein the inorganic filler particles have a concentration greater than about 30% by weight of the biodegradable thermoplastic composition.

6. An article of manufacture as defined in claim 1, wherein the sheet or film has dead-fold of at least about 50%.

7. An article of manufacture as defined in claim 1, wherein the sheet or film has dead-fold of at least about 70%.

8. An article of manufacture as defined in claim 1, wherein the sheet or film has dead-fold of at least about 80%.

9. An article of manufacture as defined in claim 1, wherein the sheet or film has a measured thickness in a range of about 0.0003" to about 0.01".

10. An article of manufacture as defined in claim 1, wherein the sheet or film has a measured thickness in a range of about 0.0005" to about 0.003".

11. An article of manufacture as defined in claim 1, wherein the sheet or film has a measured thickness in a range of about 0.001" to about 0.002".

12. An article of manufacture as defined in claim 1, wherein the sheet or film has a moisture vapor transmission rate of at least about 80 g/m<sup>2</sup>/day.

13. An article of manufacture as defined in claim 1, wherein the biodegradable thermoplastic composition includes at least one stiff thermoplastic biodegradable polymer and at least one soft thermoplastic biodegradable polymer, and optionally at least one of a nonbiodegradable polymer or fibers.

14. An article of manufacture as defined in claim 13, wherein at least a portion of the soft thermoplastic biodegradable polymer comprises thermoplastic starch that is free of plasticizers.

15. An article of manufacture as defined in claim 1, wherein the sheet or film comprises a food wrap.

16. A sheet or film formed by extruding, blowing or casting a thermoplastic melt formed from a biodegradable thermoplastic composition that comprises at least one hydrophobic thermoplastic biodegradable polymer, wherein the sheet or film is textured by a knurled or embossing-type roller so as to have dead-fold of at least about 70%.

17. A sheet or film as defined in claim 16, wherein the textured sheet or film has dead-fold of at least about 80%.

18. A sheet or film formed as a single layer by extruding, blowing or casting a thermoplastic melt formed from a biodegradable thermoplastic composition that comprises at least one hydrophobic thermoplastic biodegradable polymer and at least one type of filler particles included in an amount so that the sheet or film has dead-fold of at least about 70%, wherein the sheet or film is water-resistant and biodegradable.

19. A sheet or film as defined in claim 18, wherein the sheet or film has dead-fold of at least about 80%.

20. A sheet or film as defined in claim 18, wherein the sheet or film has dead-fold of about 100%.

21. A sheet or film as defined in claim 18, wherein the filler particles are included in an amount greater than about 10% by weight of the biodegradable thermoplastic composition.

22. A sheet or film as defined in claim 18, wherein the filler particles are included in an amount greater than about 20% by weight of the biodegradable thermoplastic composition.

23. A sheet or film as defined in claim 18, wherein the filler particles are included in an amount greater than about 30% by weight of the biodegradable thermoplastic composition.

24. An article of manufacture as defined in claim 1, wherein at least a portion of the filler particles protrude from a surface of the sheet or film.

25. An article of manufacture as defined in claim 24, wherein the particles that protrude from the surface of the sheet or film have particle size diameters that are greater than the thickness of the sheet or film.

26. An article of manufacture as defined in claim 13, wherein the stiff thermoplastic biodegradable polymer comprises at least one stiff synthetic biodegradable polymer and wherein the soft thermoplastic biodegradable polymer comprises at least one soft biodegradable synthetic polymer.

27. An article of manufacture as defined in claim 1, wherein the sheet or film is laminated after being formed to a separately-formed substrate.

28. An article of manufacture as defined in claim 27, wherein the substrate comprises a fibrous sheet or molded container.

29. A sheet or film as defined in claim 16, wherein the biodegradable thermoplastic composition comprises at least one stiff thermoplastic biodegradable polymer and at least one soft synthetic thermoplastic biodegradable polymer.

30. A sheet or film as defined in claim 18, wherein the biodegradable thermoplastic composition comprises at least one stiff synthetic hydrophobic thermoplastic biodegradable polymer and at least one soft synthetic thermoplastic biodegradable polymer.

31. A sheet or film as defined in claim 18, wherein at least a portion of the filler particles protrude from a surface of the sheet or film.

32. An article of manufacture comprising a single layer biodegradable sheet or film formed by extruding, blowing or casting a biodegradable thermoplastic composition that comprises at least one thermoplastic biodegradable polymer and at least one type of filler particles, wherein at least a portion of the filler particles protrude from a surface of the sheet or film.

33. An article of manufacture as defined in claim 32, wherein the filler particles comprise at least one type of inorganic filler particles, and wherein the sheet or film is stretched during processing so as to result in cavitation comprising tiny cavities in the vicinity of the filler particles.

34. An article of manufacture as defined in claim 32, wherein at least a portion of the filler particles have particle size diameters that exceed the thickness of the sheet or film.

35. An article of manufacture as defined in claim 32, wherein at least a portion of the thermoplastic biodegradable polymer comprises at least one stiff synthetic thermoplastic biodegradable polymer and at least one soft synthetic thermoplastic biodegradable polymer.

36. An article of manufacture comprising a single layer sheet or film formed by extruding, blowing or casting a thermoplastic melt formed from a biodegradable thermoplastic composition that consists essentially of at least one synthetic thermoplastic biodegradable polymer and at least one type of filler particles included in an amount so that the sheet or film has dead-fold of at least about 70%.

37. An article of manufacture as defined in claim 36, wherein the synthetic thermoplastic biodegradable polymer comprises at least one stiff synthetic thermoplastic biodegradable polymer and at least one soft synthetic thermoplastic biodegradable polymer.

38. An article of manufacture as defined in claim 36, wherein the sheet or film has dead-fold of at least about 80%.